BY ORDER OF THE
SECRETARY OF THE AIR FORCE

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Safety

NONNUCLEAR MUNITIONS SAFETY BOARD

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This instruction prescribes the Air Force Nonnuclear Munitions Safety Board (NNMSB). It states membership and mission, outlines procedures, and assigns responsibilities for conducting and reviewing safety studies on nonnuclear munitions, components, or related items for which the Air Force has an operational, test, development, procurement or management responsibility. It explains the safety verification and approval process for new or modified nonnuclear munitions. It applies to all Air Force organizations assigned a mission or function involving nonnuclear munitions, including US Air Force Reserve and Air National Guard. Along with USAF Systems Safety Programs, this instruction implements DODI 4120.13, *Safety Program for Chemical Agents and Weapons Systems,* AND AFPD 91-2, *Safety Programs.*

SUMMARY OF REVISIONS

This document is substantially revised and must be completely reviewed.

This revised version provides more detail for the step-by-step deliberation process of NNMSB members in approving new munitions systems. It also specifies specific grade and experience requirements for major command (MAJCOM) NNMSB members; and adds **Attachment 2** and **Attachment 3**.

1. NNMSB Members, Advisory Personnel, and Meeting Frequency:

1.1. NNMSB Members. The NNMSB is made up of experienced individuals, designated by their MAJCOMs, who occupy key staff positions within their respective commands. NNMSB members must have expert knowledge of Air Force nonnuclear munitions, related systems, and associated operational safety policies and procedures, and must be able to act as Air Force technical authorities for the purposes of the NNMSB.

1.1.1. NNMSB members must also be knowledgeable of their command unique policies, procedures and operational limitations and constraints. They will staff within their commands all read-ahead material, resolve differences, and bring command positions to the board meetings.

1.1.2. They will also actively participate in all NNMSB meetings, presenting their command's position and striving to resolve all conflicts based on the best interest of the USAF. Members will arrange for another member to act as proxy when attendance at a meeting is not possible. They will arrange new member orientation sessions with the Executive Secretary when notified of appointment to the NNMSB membership. This orientation may be done in conjunction with a normally scheduled convening of all board members. If this option is used, the new member will coordinate his/her orientation sessions with the Executive Secretary at least two weeks in advance.

1.1.3. NNMSB members must possess the authority needed to ensure a comprehensive technical review within their command of the safety studies and analyses on which NNMSB safety evaluations are based. The NNMSB membership is composed of' one voting representative from each of the following commands and agencies:

1.1.3.1. Air Force Materiel Command (AFMC)

1.1.3.2. Air Force Special Operations Command (AFSOC)

1.1.3.3. Air Education & Training Command (AETC)

1.1.3.4. Air Mobility Command (AMC)

1.1.3.5. Air National Guard Readiness Center (ANGRC)

1.1.3.6. Air Force Reserve Command (AFRC)

1.1.3.7. Air Force Operational and Test and Evaluation Center (AFOTEC)

1.1.3.8. Air Force Space Command (AFSPC)

1.1.3.9. Air Combat Command (ACC)

1.1.3.10. Pacific Air Forces (PACAF)

1.1.3.11. United States Air Forces in Europe (USAFE)

1.2. Chairmanship. The Air Force Chief of Safety, AF/SE, designates the chairperson with the grade of colonel (or civilian equivalent) or above. The chairperson, or his/her designated representative, will preside at NNMSB meetings. For a given matter before the Board, the Chairperson casts a vote only when ballot of members present results in a tie.

1.2.1. Representatives from AFMC, ACC, PACAF, AMC, AFOTEC, and USAFE constitute a quorum for conducting NNMSB business. Under unusual situations, such as short notice or conflicting requirements, quorum members may delegate their vote to another quorum member (proxy), provided the proxy member and the NNMSB chairperson agree to the delegation. When the NNMSB reviews a nonnuclear munition whose operational use is limited to one or more specific commands, representatives of such specific commands will be included in the quorum requirements.

1.2.2. Advisory Personnel. Advisory personnel (such as Explosives Ordnance Disposal, Air Logistics Center personnel, or the Armament Product Group Manger) attend NNMSB meetings, as required. At times attendance by such advisors may be essential to the effective conduct of NNMSB business. Advisors do not exercise a vote during the formal proceedings. If the membership holds that inadequate advisory expertise is present to allow proper evaluation of a munition item, then (at the discretion of the chairperson,) review of the item may be postponed until a subsequent meeting.

1.2.2.1. The Chairperson will determine the need to invite special representation to Board meetings to aid in the evaluation of specific agenda items. When operational limitations may be involved in safety certification of a given munition, the representatives of the USAF Operations Staff will be invited.

1.2.2.2. The Chairperson will also approve the composition of special ad hoc groups to provide NNMSB-related review and advisory services to special access programs.

1.2.2.3. An AFSC/SEW representative functions as an advisor or consultant to the NNMSB at every meeting.

1.2.2.4. Individual NNMSB members may invite advisors and consultants to support their respective command positions.

1.2.2.5. When operational limitations may be involved in the safety certification of a munition, advisory representation by HQ USAF/XOO will be requested by the USAF procuring or modifying activity.

1.2.2.6. Other HQ USAF offices, advisors, consultants, and representatives from other government agencies, as required, will be invited to attend when munitions for which they are responsible (or for which their expertise is required) are under review.

1.2.2.7. Other advisors whose attendance may be appropriate are representatives of the USAF procuring or modifying activity, the responsible test organization, and the user organization or unit.

1.2.2.8. Knowledgeable medical personnel may be invited to attend when items under review contain chemical agents; or depleted uranium; or radiant energy from electronic, optical, or sonic sources; or may present other biomedical hazards.

1.2.3. Meeting Frequency. Meetings of the NNMSB will be scheduled only by the chairperson or his/her representative; generally once each quarter. The chairperson will decide on a case-by-case basis if the amount of NNMSB business warrants scheduling a quarterly meeting. In addition to these regular NNMSB meetings, special meetings may be scheduled when required to support time-critical munitions development program milestones. However, the program/organization requesting such special meetings will be required to fund travel expenses incurred by the NNMSB members, the chairperson , and the executive secretary.

1.2.4. The NNMSB can be expected to conduct joint session with the weapons safety certification bodies of other services for joint development programs. Such joint activities will be covered by appropriate memoranda of understanding.

2. NNMSB Mission .

2.1. NNMSB is the review authority and the System Safety Group (SSG) for all nonnuclear munitions as defined below. As the review authority, the NNMSB's mission includes various approvals and safety certification assessments conducted at specified points in a munition's research, development, test and evaluation, acquisition, and *operational life cycle*. As a System Safety Group, the NNMSB's mission includes providing design and qualification safety guidance to program management authorities during a munition's life cycle. In carrying out its mission, the NNMSB will accomplish the following relative to nonnuclear munitions intended for Air Force operational use:

2.1.1. Review and establish design safety and qualification test criteria, standards, and requirements for nonnuclear munitions and related items.

2.1.2. Provide guidance to program management authorities throughout the life cycle of munitions programs to ensure that the criteria which form the basis for the safety certification review are receiving adequate consideration during the design, development, test evaluation, and operational deployment phases.

2.1.3. Maintain safety cognizance over all new or modified nonnuclear munitions, including those developed by the Air Force, those obtained from other US military services, and those obtained from foreign sources.

2.1.3.1. Safety certification or approval by another service or government does not replace the required NNMSB review and approval. However, this does not exclude certification and approval actions conducted jointly with another service's certification/approval authority.

2.1.3.2. For nonnuclear munitions which are developed by the Air Force but are not intended for Air Force operational use, the NNMSB retains its review authority and SSG responsibilities nonetheless. Conduct a positive safety study and review program for all nonnuclear munitions over which the NNMSB maintains cognizance.

2.1.3.3. If a munition or equipment item is safety certified under the Air Force Nuclear Safety

Certification Program (AFI 91-103), then the item is certified for nonnuclear use, provided the nonnuclear portion of the system was evaluated. Such nuclear certified munitions and equipment items are not reviewed by the NNMSB unless specifically requested by a member.

2.1.3.4. Loss of nuclear certification (for example, restricted from use by individual serial number, specific manufacturer, or removal from Technical Order 00-110N-16) does not necessarily result in the loss of nonnuclear certification.

2.1.4. During the conduct of its safety study and review program, the NNMSB:

2.1.4.1. Ensures that munitions are evaluated against USAF safety criteria, standards, and requirements and that evaluations are based on analysis results and data obtained from engineering, development, and operational testing.

2.1.4.2. Verifies (through results of evaluations) that the required level of design and performance safety is achieved during all of the munition's life cycle, that is, all phases of development, production, and Air Force operational use (including transportation, handling, maintenance, employment, and disposal) from program initiation through item removal from the Air Force inventory.

2.1.4.3. Review the safety aspects of explosives operations, when requested by a NNMSB member or HQ USAF agency, and recommend to the HQ USAF actions to improve safety or occupational health provisions of the operation.

2.1.5. Aspects of munitions systems, such as add-on components, software, and off the shelf equipment, will be evaluated as integral parts of the systems to which they belong. The following nonnuclear munition systems, subsystems, components, and related equipment items, except as noted, are within the purview of the NNMSB as it carries out its mission:

2.1.5.1. Nonnuclear Explosive Devices. All types of warheads, projectiles, bombs, mines, and grenades (plus their training configurations) which are capable of producing a hazardous reaction and are used as implements of war or training. This also includes nuclear weapon training shapes containing conventional explosives.

2.1.5.2. Nonnuclear Missiles (and Thrust-Augmented Munitions). This includes nonnuclear missiles designed for air-to-air, air-to-ground, air-to-space, ground-to-ground, ground-to-air, and ground-to-space.

2.1.5.3. Release, Control, Suspension, and Dispersal Devices. All suspension systems (for example racks, launchers, rails), dispensers, or packaging devices used to contain or disperse nonnuclear explosive devices, or used as the direct launching platform for a complete nonnuclear munition system.

2.1.5.4. Safing, Arming, and Target-Detecting Devices. All components used to safe, arm, and/or fire nonnuclear explosive devices or propulsion devices. These include all fuzes and explosive or pyrotechnic transfer elements. Also includes all components of a munition used to detect a target and issue signals for initiation of the kill mechanism (warhead, bomb, etc.).

2.1.5.5. Guidance and Control Mechanisms. All components integral to a nonnuclear munitions system used to direct the munition from the launching platform to the target. These include aerodynamic control surfaces, thrust vectoring devices, and retardation device, and their associated control logic, seekers, and stored-energy sources.

2.1.5.6. Igniters and Initiators. All devices used in igniting or directing the initiation of nonnuclear explosive or pyrotechnic devices, fuzes, propulsion devices, stored-energy sources, or dispersal and suspension devices.

2.1.5.7. Guns and Ammunition. All guns and associated control, safing, and firing mechanisms, and all gun-fired ammunition. (Includes aircraft guns, small arms, and all gun-fired ammunition.) Explosive powder will be certified for stability if it is not in the Department of Defense inventory.

2.1.5.8. Miscellaneous. Flares and markers, pyrotechnics, photoflash devices, explosive dispensers or decoy devices, explosives simulators, destructors, missiles and unmanned aerial vehicles (UAV), demolition material, explosive ordnance disposal (EOD) equipment using explosives or controlling the initiation of explosives, chemical agents and dispensers, training and scoring items, targets that contain hazardous components, and other munitions-related explosive items.

2.1.5.9. Propulsion Devices. Rocket motors and engines that produce thrust by the release of energy and are used to propel any of the devices or mechanisms defined in paragraphs **2.1.5.1.** through **2.1.5.8.** above.

2.1.5.10. Support and Test Equipment. All handling, storage, test, maintenance, and transport equipment for use with or in support of nonnuclear munitions, including locally manufactured equipment (LME). Test equipment includes commercially available equipment, used for testing safety critical functions (for example, arming or firing circuits) of nonnuclear munitions systems, subsystems, and components.

2.1.6. Exclusions. The NNMSB does not evaluate the following areas:

2.1.6.1. Explosive components of aircraft egress and life support systems.

2.1.6.2. Unmanned aerial vehicles (for example: target, decoy, and surveillance drones) except their explosive flight termination systems or unless the vehicle is designed to deliver nonnuclear munitions.

2.1.6.3. Nuclear, space or nuclear missile systems require separate system safety groups.

2.1.6.4. Locally manufactured equipment introduced prior to 21 June 1984, unless the using MAJCOM safety staff recommends NNMSB review and certification.

2.1.6.5. Locally manufactured equipment (LME) which receives MAJCOM level safety approval after 21 June 1984. LME approved at the MAJCOM level must meet acceptable levels of design and performance safety as determined by MAJCOM safety staff review.

2.1.6.6. General purpose equipment such as ground transport and passenger vehicles and commercial forklifts,

2.1.6.7. Explosive items peculiar to a specific aircraft which are exempted from NNMSB review by the NNMSB Executive Secretary, provided an adequate systems safety review is conducted by another qualified agency. (For example, a practice bomb with spotting charge and new equipment items such as a bomb sling do not require formal NNMSB review for live flight test approval (THAR) or certification for operational use (MSA, TMSS.) The Executive Secretary evaluates these items to the extent required and apprises the NNMSB members of the results of the evaluation at the next meeting. With concurrence of the NNMSB mem-

bers at that meeting, the item is included in the NNMSB minutes as being approved for flight testing or recommended for Air Force use. A summary of such exemptions will be provided to NNMSB members at scheduled meetings.

2.1.6.8. Aircraft-munition interface equipment whose functional characteristics (mechanical and electrical) are under configuration control of the aircraft design authority. By contrast, interface equipment whose characteristics are under configuration control of the munition design authority are covered in paragraph **2.1.5.3.** above.

3. General NNMSB Policy.

3.1. In support of the mission of the NNMSB, the following general policy applies to all nonnuclear munition systems, subsystems, components, and associated support equipment over which the NNMSB maintains cognizance:

3.1.1. Approval by the NNMSB is required prior to airborne testing of live-loaded uncertified munitions and initiating devices.

3.1.2. Prior to entry of a nonnuclear munition into the Air Force inventory, regardless of source, a HQ USAF safety certification or approval is required. Certification or approval will normally be based on NNMSB safety certification recommendation. Safety certification or approval by another US military service or foreign government does not replace NNMSB review and approval requirements.

3.1.3. No munition or related equipment item will be released for operational use until adequate technical data (maintenance, storage, loading, EOD procedures, etc.) are available to the user. Final certification will not be recommended by the NNMSB until final technical order action has been completed.

3.2. Technical Safety Functions. In support of its mission, the NNMSB is charged with accomplishing these technical safety functions:

3.2.1. Tailoring design safety criteria and standards and establishing safety performance requirements for nonnuclear munitions systems, subsystems, components, and related items for which the NNMSB has cognizance under its mission statement.

3.2.2. Identifying and evaluating the hazards in the design of munitions systems, subsystems, components or related items using the system safety engineering principles outlined in Military Standard 882 (MIL STD 882). Recommending methods to reduce the risk of hazards that are identified during NNMSB proceedings to a level acceptable to the Air Force.

3.2.3. Establishing or approving procedures and warnings to help protect personnel, equipment, and property when risks cannot be adequately controlled through design provisions.

3.2.4. Developing safety recommendations which minimize risk during the life cycle of nonnuclear munitions, taking into consideration the mission requirements, employment concepts, and operating environments.

3.2.5. Minimizing retrofit actions required to improve design safety. To do this, the NNMSB identifies and includes safety design criteria during the development phase of each munition system, subsystem, component or related item.

3.2.6. Using historical safety data and lessons learned from similar munitions programs to help evaluate new munition designs.

4. Certification, Test, and Safety Standards Function.

4.1. NNMSB design safety certification action is required for each nonnuclear munition prior to its entry into the USAF operational inventory. The NNMSB will not recommend final certification until adequate technical data is available to the user.

4.1.1. Certification is based on a Technical Munitions Safety Study (TMSS) or Munitions Safety Analysis (MSA) reviewed during a regular or special meeting.

4.1.1.1. The TMSS is a comprehensive safety study of a nonnuclear munition, used to document safety engineering evaluations and to submit safety findings for NNMSB review. The TMSS must contain sufficient information to fully support the certification recommendations formulated by the board.

4.1.1.2. The MSA is less comprehensive than the TMSS and is typically prepared for modified munitions and munitions support equipment that have a minor impact on safety. Like the TMSS, the MSA must fully support NNMSB recommendations.

4.1.1.3. Since the MSA is not subject to HQ USAF approval after NNMSB review (except as noted below in paragraph **4.1.2.**), the MSA should not be used as the basis for Board action when a certification issue regarding higher level management attention is expected, regardless of the development status or intended use of the item under review. The Executive Secretary is available to provide guidance as to the appropriateness of the MSA versus the TMSS for any given item.

4.1.1.4. Some certification matters that come before the Board may not require a TMSS, TMSS supplement, or MSA (for example, approval of an energetic material for use in uninterrupted explosives trains.)

4.1.1.5. The NNMSB members and Chairperson will be provided the draft edition of the TMSS or MSA in sufficient time prior to the scheduled meeting to allow proper review within the members' MAJCOMs. In no case will the review time be less than 25 days (for example, 1 or 2 straightforward studies.) For ambitious meeting agendas (for example, 4 or 5 studies for complex weapons), some of the draft TMSSs and MSAs will be distributed 45-50 days in advance, to level the members' review work load. Read-ahead information will also be provided for other (non-certification) meeting business requiring a Board decision. Such read-ahead information will be provided at least 14 duty days prior to the meeting. If any Board member states insufficient time was provided for a proper MAJCOM review, then the item in question will be removed from the meeting agenda.

4.1.1.6. If, during their review, the Board members have questions or identify concerns, they will inform the TMSS or MSA preparing activity so that additional information may be made available at the NNMSB meeting.

4.1.2. Following formal review of the draft safety study, NNMSB design safety conclusions and certification recommendations are included in the TMSS or MSA. The TMSS is then prepared for review and approval by HQ USAF and SECAF agencies. Except for reports pertaining to chemical agents and weapons, the MSA does not require HQ USAF and SECAF approval.

4.1.3. The Executive Secretary will maintain up-to-date reference material on the scope, content, level of detail, and format requirements for the TMSS and MSA and will provide appropriate guidance to agencies charged with preparing a TMSS or MSA.

4.1.4. HQ USAF/SE forwards TMSSs and Munitions Safety Analyses (MSA) pertaining to chemical agents and chemical weapons systems to the Deputy Assistant Secretary of the Air Force for Environment, Safety, and Occupational Health (SAF/MIQ) for review and distribution to the Assistant Secretaries of the Air Force for Atomic Energy and Force Management and Personnel, respectively.

4.2. Test Approval Functions. The NNMSB issues design safety approvals for testing of uncertified munitions and initiating devices (for example, fuzes) which involves the airborne launch of the munition from USAF aircraft. The captive carriage phase of such flight test programs may be entered prior to NNMSB approval for the live launch phase. NNMSB approval is not required for flight test of new munitions that are inert loaded.

4.2.1. The basis for the flight test approval is the Test Hazards Assessment Review (THAR) conducted during a regular or special meeting.

4.2.1.1. Under extraordinary circumstances the Board members may be requested to issue flight test approvals individually in lieu of a formal meeting. In this situation, approval must be unanimous. This procedure may be used only with the agreement of the Chairman and all quorum members.

4.2.2. The Board members and Chairman will be provided read-ahead information at least 14 duty days prior to conducting a THAR. Such information may be a simple point paper for non-complex items or it may be a comprehensive technical data package for test munitions that are potentially more hazardous.

4.2.3. If the NNMSB flight test approval is issued conditional upon completion follow-on actions, the Executive Secretary will monitor these actions until their completion. If NNMSB flight test approval is not issued, the Executive Secretary will inform the requesting agency of the reasons for non-approval.

4.3. Safety Standards Functions. The NNMSB is the USAF focal point for the development and/or adoption of design and performance safety standards for nonnuclear munitions.

4.3.1. Once approved by the NNMSB, such standards play a major role in determining a munition's design safety acceptability during the Board certification process. This applies equally to munitions developed or procured to performance or commercial specifications.

4.3.2. Attachment 3 lists those standards currently approved by the NNMSB and considered applicable to the design, development, test, and evaluation of nonnuclear munitions intended for use by USAF units.

4.3.3. The Executive Secretary will maintain cognizance of national and international standardization activities (including those in the private sector) and will offer additional standards for possible NNMSB approval as appropriate. See attachment 3.

4.4. System Safety Group Functions. The NNMSB is available to provide guidance to program management authorities responsible for acquisition of nonnuclear munitions on design safety, analysis and

testing matters that could have a bearing on future certification When providing these services, the NNMSB is functioning as a Systems Safety Group (SSG.)

4.4.1. The Board members and Chairman will be provided read-ahead information prior to meetings at which NNMSB SSG services are scheduled. Such information may be a simple point paper for straight forward matters, or may be a comprehensive technical data package for major design, analysis, or test issues.

4.4.2. Guidance formulated by the NNMSB will normally be documented in the meeting proceedings. If a program management authority believes this approach might impact acquisition strategy, the NNMSB may direct the Executive Secretary to provide the guidance via correspondence addressed exclusively to the program management authority.

5. Safety Studies and Reviews.

5.1. The primary tool used by the NNMSB to evaluate the nonnuclear munitions and related equipment items under its cognizance is a positive safety study and review program. This involves application of MIL STD 882 techniques to make sure that each nonnuclear munition and associated support and test equipment item, other munitions related items, and all operating procedures and technical data meet the highest safety standards. The safety evaluation process considers design, logistics, and operational requirements throughout the items' life cycles. The program requires the maximum use of existing safety documentation and lessons learned.

5.1.1. Nonnuclear Munitions Safety Study and Review Process:

5.1.2. The agency (Program Executive Officers, Designated Acquisition Commanders, System Program Directors, Product Group Managers, Joint Program Offices, etc.) responsible for procuring or modifying nonnuclear munitions, including all nonnuclear missiles and related items specified in paragraph 2, is also responsible for ensuring the requirements of this directive are satisfied. These responsibilities include management actions to:

5.1.2.1. Ensure munitions/items requiring NNMSB study and review are identified to the Executive Secretary early in the design or acquisition process. This will allow review and certification actions to begin early enough so that the effects of the NNMSB review on schedule and procurement costs are minimized.

5.1.2.2. Ensure that all required design safety standards (in paragraph 6) are complied with and that adequate resources are allocated for explosives hazard classification action (including possible testing as specified in TO 11A- 1-47).

5.1.2.3. Ensure the appropriate safety studies such as Technical Munitions Safety Study (TMSS), Munitions Safety Analysis (MSA), or Test Hazard Assessment Review (THAR) are prepared at the earliest date possible in the development cycle, but no later than specified in paragraphs below. Early review by the NNMSB is highly desirable so that impacts of safety related design changes, if any, are minimized.

5.1.2.4. Submit a reproducible copy of the study or review documentation to the Executive Secretary at least 60 calendar days prior to the NNMSB meeting at which the review is scheduled.

5.1.2.5. Provide a presentation of the study or review documents at the scheduled NNMSB meeting. The purpose of the presentation is to address design safety issues of the items under

review and to respond to any concerns or questions the NNMSB members may have. Guidance on presentation scope, level of detail, and format should be requested from the Executive Secretary.

5.2. The NNMSB members are responsible for carrying out the actions specified throughout this instruction.

5.2.1. To ensure an effective review process, a thorough evaluation of each study and review document prior to NNMSB meeting is required, and it is vitally important for members to bring appropriate staff positions from their MAJCOM headquarters to meetings.

5.2.2. Each NNMSB member is expected to voice any safety concerns to the NNMSB membership and the USAF agency responsible for procurement or modification of the item being studied/reviewed.

5.2.3. The Executive Secretary interacts with the NNMSB Chairman, NNMSB members, USAF procuring/modifying agencies, system program offices, or other agencies, as necessary, to ensure the effectiveness of the NNMSB safety/review process. Paragraph **12.** provides details on Executive Secretary responsibilities.

5.2.4. Preparing a Technical Munitions Safety Study (TMSS) (see **Attachment 2**). The TMSS is a detailed safety study of a nonnuclear munition used to document safety engineering findings and to submit safety recommendations for NNMSB review.

5.2.4.1. Following NNMSB review, the TMSS is forwarded to applicable HQ USAF agencies with the NNMSB's recommendations.

5.2.4.2. Upon Air Staff approval, NNMSB recommendations become directive on the specified action agencies.

5.2.5. A TMSS is prepared for each nonnuclear munition and related item over which the NNMSB maintains cognizance as specified in its mission statement.

5.2.5.1. The study is usually prepared by an AFMC system safety engineering organization. However, it may be prepared by any organization which has at its disposal the necessary safety engineering expertise.

5.2.5.2. The TMSS is not required to present design details which are not directly related to design and performance safety evaluations. The TMSS should not be used as source data for any munition, and should be considered to carry the same limitations on disclosure as other safety documentation used expressly for mishap prevention.

5.2.6. A TMSS is usually not prepared before the start of development, test, and evaluation (DT&E), or the start of the initial operational test and evaluation (IOT&E) portion of a combined DT&E/IOT&E.

5.2.6.1. However, approval through a TMSS or Test Hazard Assessment Review (THAR) is required before a dedicated IOT&E or follow-on operational test and evaluation (FOT&E) can begin.

5.2.6.2. A TMSS which supports the safety certification recommendation must be reviewed by the NNMSB and approved by HQ USAF prior to entry of production items into the Air Force inventory.

5.2.7. Preparing a Munitions Safety Analysis. When the preparing activity decides that a new or modified munition has only a minor impact on safety, the activity may prepare, with the concurrence of the Executive Secretary of the NNMSB, an MSA instead of a complete TMSS.

5.2.7.1. However, the NNMSB may direct that a complete TMSS be prepared on the item. The MSA includes only that information needed to support the conclusion that the item or modification to an item has only a minor impact on safety, and to demonstrate the degree of safety in the item.

5.2.7.2. An MSA is usually required for newly designed or modified unique or peculiar support equipment used with nonnuclear munitions. The MSA is not subjected to HQ USAF review and approval.

5.2.8. Preparing a Test Hazard Assessment Review. A THAR is the minimum analysis necessary before live airborne testing of uncertified munitions and initiating devices can be done.

5.2.8.1. The intent of this assessment is to prevent danger to, or loss of, aircrew and aircraft during live test of uncertified munitions and initiating devices.

5.2.8.2. Munitions which must be approved by the NNMSB for live airborne testing include items loaded with live energetic material such as bombs, warheads, cluster bomb units, projectiles, rocket motors, flares, bursting charges, or similar devices.

5.2.8.3. Initiating devices which must be approved for live airborne testing include fuzes, rocket motor arm/fire devices, flare safety and ignition devices, and devices having an influence on initiation, such as retarders, launchers, and suspension racks.

5.2.8.4. The live flight test approval requirement does not prevent test of uncertified initiating systems when the items they control are inert filled.

5.2.8.5. The THAR must contain a physical and functional description of the item, along with sufficient analysis to ensure the item is safe for use within the controlled test environment. Review and approval of a TMSS or an MSA by the NNMSB satisfies the requirement for a THAR.

6. Developing Munitions Design Safety Standards and Criteria.

6.1. All commands with NNMSB membership jointly develop and submit to the NNMSB, for HQ USAF approval, mandatory design safety standards for each type of munition.

6.1.1. The design safety standards will incorporate a life cycle approach. Design criteria will ensure the munition can be safely handled, stored, and operated in all environments it can be reasonably expected to experience throughout its life cycle.

6.1.2. Safety standards must be given equal consideration along with logistics and operational requirements.

6.2. Deviations from these standards are authorized only on the NNMSB's recommendation and interim approval by HQ AFSC/SEW.

6.2.1. Deviations from the standards will not be considered unless alternative design concepts or procedures are provided which, in the opinion of the NNMSB members, meet the intent of the applicable standard.

6.2.2. When a deviation is recommended by the NNMSB and approved or disapproved by HQ AFSC/SEW, the applicable HQ USAF agencies are the final approval or disapproval authorities through review of the NNMSB minutes.

6.3. Design safety standards have been developed for certain types of munitions or components (for example, MIL-STD-1316C, "Fuze, Design Safety, Criteria for," and MIL-STD1455A, "Dispenser and Submunition, Air Delivered, Safety Design and Safety Qualification Criteria for"). See **Attachment 3**.

6.4. The NNMSB (members and advisory personnel) will meet in formal session when called by the chairperson, or designated acting chairperson. During formal session, the NNMSB will:

6.4.1. Make a comprehensive review of TMSS, MSA, and THAR presented relative to selected developmental, prototype, and existing nonnuclear munitions and associated support equipment. The reviews will consider such related issues as the potential requirement for shields and barricades during electrical testing, safety adequacy of packaging concepts, and the availability of required technical data, including EOD procedures.

6.4.2. Identify areas of design safety deficiency relative to items under review. Specify conditions for certification when such deficiencies are noted.

6.4.3. Develop or review design safety standards, and recommend the adoption for Air Force use as appropriate. Recommend policies, controls, and procedures to minimize hazards during nonnuclear munitions operations. Charter special projects and ad hoc groups as required.

6.5. For each meeting, the NNMSB will document a comprehensive set of minutes. For each item under review, the minutes (and the TMSS or MSA as necessary) will include applicable findings, recommendations, and required additional actions and will designate the primary action agency. The NNMSB minutes certify that each munition studied is acceptable, or not acceptable, for further testing or use from a design safety viewpoint. When the minutes are signed by each member and approved by the chairperson , they are the official NNMSB position.

6.5.1. The meeting minutes may grant interim safety approval or certification for nonnuclear munitions or related items; however, HQ USAF is the final approval and certification authority.

6.5.1.1. Commanders may proceed with operationsbased on recommendations in meeting minutes, pending HQ USAF concurrence.

6.5.1.2. If HQ USAF disagrees with meeting minutes, HQ AFSC/SEW will notify applicable commanders of disapproval or modification of interim approval or certification.

6.5.2. A concerted effort is made by the NNMSB and the chairperson to obtain unanimous agreement of the members on all action items and recommendations.

6.5.3. If unanimity cannot be achieved, minority reports are prepared by the dissenting members and are made a part of the official minutes.

6.6. The signed NNMSB minutes and TMSS, with relevant findings and recommendations, are forwarded to HQ AFSC/SE, 9700 G Ave., SE, Kirtland AFB NM 87117-5670. HQ AFSC/SEW acts as the coordinating agency to obtain HQ USAF review and approval:

6.6.1. Approval of a recommendation to develop or modify a system signifies HQ USAF awareness that such action would be desirable from a safety viewpoint. It does not mean that such an

action will be officially proposed, initiated, or funded by HQ USAF as a direct result of the recommendation. This is the primary responsibility of the action agency.

6.6.2. After they are approved by HQ USAF, the NNMSB's recommendations (as documented in the meeting minutes) are directive on the designated action agency. The action agency initiates and monitors action on the recommendations and makes periodic status reports to the Executive Secretary of the NNMSB until final action item closeout.

7. Administrative Procedures.

7.1. Meeting Frequency. Normally, four regular meetings of the NNMSB are held annually. Special meetings may be called to support time-critical acquisition program activities.

7.1.1. Notification of regular meetings will be issued by the Executive Secretary at least 30 days in advance.

7.1.2. For special meetings the Executive Secretary will inform the requesting agency that funding of the Board members' and Chairman's travel expenses may be a condition for conducting the special meeting. The Executive Secretary will poll the members as to their availability before final meeting dates are established.

7.1.3. The Chairman (or designated alternate) and all quorum members (or designated proxies) must be present at a meeting in order for NNMSB business to be conducted. If a quorum member command is not represented and no proxy has been designated, the chairman will determine if the meeting will proceed with the members present.

7.2. Protocol. For each matter requiring a Board position, the members will make a concerted effort to reach unanimous agreement.

7.2.1. When unanimous agreement is not possible, the majority position is established by open ballot of the members.

7.2.2. The Chairman casts a vote only when ballot of the members present (including the proxy votes) results in a tie.

7.2.3. Members representing the minority position may, at their discretion, prepare a minority report for inclusion in the official meeting minutes.

7.3. Presentations. Essentially all items appearing in a NNMSB meeting agenda will be supported by a structured presentation. The presentation is intended to answer Board members' questions arising during documentation review and to stimulate detailed discussions.

7.3.1. Agencies responsible for preparing NNMSB presentations should assure that the essential supporting personnel (AF program management authorities, contractor representatives, etc.) are present to participate as needed during the presentation and resulting discussions.

7.3.2. The Executive Secretary will provide appropriate guidance to agencies charged with preparing and delivering NNMSB presentations.

7.4. Meeting Minutes and Reports. Following each meeting, comprehensive meeting minutes are prepared and Board recommendations are included with the TMSSs that have been reviewed.

7.4.1. The Executive Secretary will finalize the meeting minutes and update TMSSs (amended to include NNMSB findings and recommendations) and will submit the entire report to HQ USAF/

SE (coordinating agency: HQ AFSC/SEW) for execution of the HQ USAF and SECAF approval process.

7.4.2. Prior to notification of HQ USAF approval, the NNMSB meeting minutes constitute interim fulfillment of approval/certification requirements.

7.4.3. As appropriate, the Executive Secretary will notify program management authorities, test organizations, and unit commanders that they are authorized to proceed with planned activities and operations based on NNMSB's recommendations.

7.4.4. If HQ USAF disapproves an NNMSB recommendation, the Executive Secretary will notify concerned agencies of the change in certification status.

7.4.5. Once notified of HQ USAF's approval of a TMSS, the Executive Secretary will publish the report in its final version and distribute to the NNMSB members and associates, agencies responsible for implementing NNMSB recommendations, and other interested organizations. Electronic communication will be used to the maximum extent possible.

7.5. Action Items. Once NNMSB meeting minutes are approved by HQ USAF, actions to implement Board recommendations are monitored until completion.

7.5.1. The Executive Secretary will periodically request action item completion status reports from designated action agencies.

7.5.2. The Executive Secretary further arranges for action item status to be reported at each NNMSB meeting.

7.5.3. The NNMSB determines when a recommended action item has been successfully completed.

7.5.4. The NNMSB may delegate to the Executive Secretary the authority to close purely administrative action items or to close a given action item upon the completion of a specific event (for example, the publication of a technical order.)

7.5.5. When all action items related to a munition certification have been closed, final certification of that munition is therefore granted. Final certification is documented in the minutes of the NNMSB meeting at which closure occurred.

8. HQ USAF Agencies .

8.1. Normally, HQ AFSC/SEW, upon the approval of HQ USAF/SE, forwards NNMSB Meeting Minutes and Technical Munitions Safety Studies (TMSS) to SAF/AQPB, SAF/MIQ, HQ USAF/ILMW, and HQ USAF/XOFW for review and concurrence. These agencies must respond to HQ USAF/SE within 30 calendar days indicating concurrence or nonconcurrence with NNMSB findings and recommendations.

8.2. Concurrence with NNMSB findings and recommendations is formal HQ USAF approval or certification. HQ USAF/SE documents the headquarters' position in a letter to the NNMSB Executive Secretary.

9. HQ USAF/SE.

9.1. HQ AFSC/SEW, on behalf of HQ USAF/SE, is the focal point for all NNMSB matters within HQ USAF and as such attempts to resolve disagreements within HQ USAF on any NNMSB findings or recommendations and obtains a final position on NNMSB proceedings. HQ USAF/SE obtains necessary HQ USAF coordination on NNMSB reports. Advises the NNMSB as to HQ USAF policy on issues that arise during formal proceedings.

10. HQ AFSC/SEW.

10.1. Acts as approval authority for requests to deviate from mandatory design requirements.

10.2. Reports unfavorable mishap trends identified for munitions previously certified by the NNMSB that could require reevaluation by the NNMSB.

11. AFMC.

11.1. AFMC designates a NNMSB member.

11.2. AFMC designates an engineering support function responsible to conduct NNMSB studies and analysis.

11.3. AFMC also designates an Executive Secretary of the NNMSB.

12. The Executive Secretary.

12.1. This person is the principal administrative assistant and key advisor to the chairperson and members for conducting NNMSB affairs.

12.2. The Executive Secretary consults with the USAF procuring organizations, program offices, managers, or other agencies as necessary, to clarify the requirements of this instruction.

12.3. He/she also informs the chairperson about NNMSB activities and issues that might affect NNMSB proceedings.

12.4. The Executive Secretary will maintain a list of appointed NNMSB members and alternates. The Secretary will provide the administrative services necessary to conduct NNMSB meetings. He/she will also provide new member orientation.

12.5. He/she will maintain up-to-date preparation instructions for TMSSs and MSAs, technical read-ahead documentation, and NNMSB presentations.

12.6. If HQ USAF disapproves a NNMSB recommendation on certification or noncertification of any given nonnuclear munition, the Secretary notifies the appropriate program management authorities of its change in certification status.

12.6.1. The Executive Secretary will take the following actions to schedule meetings authorized by the Chairman:

12.6.1.1. Issue a meeting announcement at least 30 days in advance of a regularly scheduled meeting.

12.6.1.2. Poll the Board members to determine their availability when the need for a special meeting is identified.

12.6.1.3. Inform the agency requesting a special meeting that funding of the Board members' and Chairman's travel expenses may be a condition for conducting the special meeting.

12.6.1.4. Establish the meeting agenda.

12.6.1.5. Establish the deadline for submission of reproducible manuscripts of safety studies scheduled for review, normally 60 days prior to the meeting date.

12.6.1.6. Invite appropriate advisors and special representatives to attend meetings as directed by the Chairman.

12.6.1.7. Provide all administrative services needed to support a meeting (for example, arrange billeting and conference rooms.)

12.6.2. The Executive Secretary will examine all documentation intended for NNMSB review to assure appropriateness and technical quality, and will also perform the following actions:

12.6.2.1. Assure TMSSs and MSAs are circulated to the NNMSB membership sufficiently in advance of a meeting to allow 45 days for review.

12.6.2.2. Request HQ USAF/SE waive the 45 day requirement when unavoidable delays in TMSS/MSA distribution arise.

12.6.2.3. Assure read-ahead information to support THARs, SSG activities, and other matters requiring NNMSB action is received by the members at least one week before the meeting.

12.6.2.4. Notify the preparing organization when documentation is deemed unacceptable for NNMSB reviewing, providing guidance as to changes needed to produce acceptable quality. The preparing organization will make necessary changes and resubmit documentation to the Executive Secretary for approval.

12.6.2.5. Assure related studies, correspondence, and background material will be available at the NNMSB meeting. The Executive Secretary will establish post-meeting liaison with agencies having a direct interest in the results of NNMSB proceedings.

12.6.3. Specifically, the Executive Secretary will accomplish the following:

12.6.3.1. Monitor follow-on actions established as a condition of an NNMSB flight test approval and issue the final approval when the actions are completed.

12.6.3.2. Notify program management authorities, test organizations, and unit commanders when they are authorized to proceed with planned activities and operations based on NNMSB's recommendations.

12.6.3.3. Notify concerned agencies of the change in certification status should HQ USAF disapprove a NNMSB recommendation.

12.6.3.4. Notify agencies responsible for implementing NNMSB recommendations once these recommendations have received HQ USAF approval.

12.6.3.5. Provide to program management authorities guidance issued by the Board in its SSG capacity when inclusion of such guidance in the official NNMSB meeting minutes is deemed inappropriate.

12.6.4. The Executive Secretary will assure the NNMSB meeting proceedings are fully documented and approved, which includes:

12.6.4.1. Making available draft meeting minutes for review by the Board members as the last item of meeting business.

12.6.4.2. Forward the final meeting minutes and updated TMSSs to HQ AFSC/SEW, who, in turn, will submit them to HQ USAF/SE for approval action.

12.6.4.3. Publishing and distributing final MSAs after NNMSB approval and final TMSSs after HQ USAF approval.

12.6.5. The Executive Secretary will manage reporting of the status of actions taken to implement approved NNMSB recommendations. Specifically, he/she will:

12.6.5.1. Periodically request action item status reports from designated action agencies.

12.6.5.2. Report action item status at each NNMSB meeting.

12.6.6. The Executive Secretary will maintain cognizance of national and international standardization activities involving the design and performance safety, analysis, and test of nonnuclear munitions, and will offer such standards for possible NNMSB approval, as appropriate.

12.6.7. The Executive Secretary will maintain all NNMSB historical records, including meeting proceedings, indexes of TMSSs and MSAs, and logs of administrative closures issued by the Executive Secretary. He/she will assure the Board members are provided current copies of these indexes and logs and the NNMSB Membership Roster.

12.6.8. The Executive Secretary will maintain the NNMSB certification data base and will prepare the Catalogue of NNMSB Actions. Annual catalogue updates will be distributed to Board members.

13. AFSOC, AETC, AMC, NGB, AFRC, AFOTEC, AFSPC, ACC, PACAF, and USAFE.

13.1. The commands must carry out responsibilities identified in this instruction. Additionally, each command designates a NNMSB member and alternate.

13.2. The MAJCOM member must have the authority necessary to ensure a comprehensive command review of NNMSB safety studies and analyses. Designated members should serve at least three years and should (whenever possible) be a field grade officer or equivalent grade civilian; however, the primary objective is for MAJCOMs to select the best individuals (military or civilian) with the training, operational experience, and technical credibility necessary to efficiently conduct NNMSB business. Members will be prepared to do a minority report if the majority position is not consistent with their respective MAJCOM's position; members will champion their MAJCOM.

FRANCIS C. GIDEON, JR., Maj Gen, USAF
Chief of Safety

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

Abbreviations and Acronyms

ACC—Air Combat Command

AETC—Air Education and Training Command

AF/ILMW—Air Force Deputy Chief of Staff, Installations and Logistics, Munitions and Missiles Plans and Policy Division

AFMC—Air Force Materiel Command

AFOTEC—Air Force Operational Test and Evaluation Center

AFRC—Air Force Reserve Command

AFSPC—Air Force Space Command

AF/XOFW—Air Force Directorate of Forces, Weapons Division

AF/XOO—Air Force Deputy Chief of Staff, Air and Space Operations, Operations andTraining Directorate

AMC—Air Mobility Command

APGM—Armament Product Group Manager

MSA—Munitions Safety Analysis

NNMSB—Nonnuclear Munitions Safety Board

PACAF—Pacific Air Forces

SAF/AQPB—Secretariat of the Air Force, Directorate of Global Power Programs Division

SAF/MIQ—Deputy Assistant Secretary of the Air Force for Environment, Safety, and Occupational Health

SSG—System Safety Group

TMSS—Technical Munitions Safety Study

USAFE—United States Air Forces in Europe

Attachment 2

TECHNICAL MUNITIONS SAFETY STUDY (TMSS) INSTRUCTIONS

A2.1. A TMSS includes the following information, if applicable:

A2.1.1. A description of the munition item.

A2.1.2. A sequential description of how the munition functions in its operational environment.

A2.1.3. A hazard analysis of the munition system according to MIL-STD-882. This analysis must deal with interfaces of the munition item with other systems and subsystems, including test equipment and technical data.

A2.1.4. A summary of mishaps and undesirable design features of similar inventory munitions (lessons learned). The mishap history may be obtained from AFSC/SEW.

A2.1.5. A safety-oriented evaluation of the technical data generated during development of the munition item, including storage, maintenance, operation, surveillance, inspection, and demilitarization procedures, if applicable.

A2.1.6. Health assessment by bioenvironmental engineering, if required.

A2.1.7. Final or interim hazard classification data (TO 11A-1-47).

A2.1.8. Firefighting extinguishing agents, if available.

A2.1.9. Appendices containing essential information from specifications and test reports to support findings.

A2.1.10. Findings and conclusions of the preparing individual.

A2.1.11. Findings and recommendations (after NNMSB review).

A2.1.12. Action items (after NNMSB review).

A2.1.13. Other information necessary to define the level of safety incorporated in the item (for example, a determination if a fuze meets prefuzing criteria).

A2.1.14. A page for HQ USAF approvals or comments. NOTE: An amendment or supplement may be submitted if production or design changes were not available.

A2.1.15. The color of the TMSS cover indicates its status and its authorized distribution.

A2.1.16. Use a white cover on the initial (draft) TMSS furnished to NNMSB members for review. This draft may contain (or have attached) copies of data and drawings. These may be essential for the in-depth review required by the NNMSB, but are not necessary for further processing. In this event remove the material after the NNMSB's review and insert a note to indicate the availability and location of the material.

A2.1.17. This draft is distributed only to the originating agency, the NNMSB Executive Secretary, HQ AFSC/SEW, and the NNMSB members. NNMSB members also may distribute it within their commands.

A2.1.18. After the NNMSB has approved the study and made the necessary corrections, add a section to the front of the study. This section shows the NNMSB's recommendations and includes a signature of approval page.

A2.1.18.1. Replace the white cover with an orange cover to identify “COPY." Forward seven copies to HQ AFSC/SEW for HQ USAF review. Forward a copy to HQ USAF/XOOT, and HQ USAF/XOOR for review.

A2.1.19. These agencies must respond to HQ AFSC/SEW within 30 calendar days indicating concurrence or nonconcurrence with NNMSB findings and recommendations.

A2.1.20. If there is nonconcurrence on NNMSB recommendation or finding and AFSC/SEW cannot obtain a unified staff position, OSAF/IGA is the office required to obtain a final HQ USAF approval or disapproval.

Attachment 3

STANDARDS AND SPECIFICATIONS APPROVED BY NNMSB

The following documents contain safety design and performance, test, and analysis criteria approved by the NNMSB for the design and evaluation on nonnuclear munitions.

Document	Date	Subject Matter
MIL-STD-331A	15/10/76	Fuze testing procedures
MIL-STD-454N	30/06/92	Electronic equipment design criteria
MIL-STD-461D/	11/01/93	Electronic compatibility
MIL-STD-462D		requirements and testing.
MIL-STD-810E	14/07/89	Environmental testing methods
MIL-STD-882C	19/01/93	System safety program requirements
MIL-STD-1316D	09/04/91	Fuze design safety criteria
MIL-STD-1385B	01/08/86	Hazards of electromagnetic radiation to ordnance (HE-RO) design criteria
MIL-STD-1455A	01/06/86	Dispenser munition design safety criteria
MIL-STD-1512	21/03/72	Electroexplosive systems design and test criteria
MIL-STD-1648A	30/09/82	Standard fuel fire test
MIL-STD-1751	20/08/82	Explosives Qualification tests
MIL-STD-1760A	01/09/85	Aircraft stores interface design requirements
MIL-STD-1901	22/01/92	Rocket motor ignition device design criteria

MIL-STD-2105B	12/01/94	Hazard assessment testing procedures
MIL-STD-25535A	06/04/59	Rocket motor preliminary flight rating test (PFRT) procedures
MIL-STD-28800E	03/09/91	Electronic test equipment design criteria